EUROPLEX TECHNOLOGIES

3GS Wireless Node
User Guide

E-LAB-1436

Warning: While this system is an advanced design integrated security system, it does not offer guaranteed protection against burglary, fire or other emergency. Any alarm system, whether commercial or domestic, is subject to compromise or failure to warn for a variety of reasons.

Therefore, good installation practices, thorough testing, and regular maintenance by the installation company and frequent testing by the user are essential to ensure continuous satisfactory operation of the system. It is recommended that the installation company offer a maintenance program and instruct the user with the correct procedure for use and testing of the system.

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E-LAB-1436 3GS Wireless Node User Guide, Issue 10, November 2006

Una versión española de este documento está disponible en el CD de información que se incluye con la central SigNET.

Une version française de ce document est disponible sur le CD d'information qui est inclus avec la centrale SigNET.

Caution

All forms of Radio Communications are subject to electromagnetic interference. Signal strength can vary depending on environmental and physical conditions. Any changes to the building structure or equipment within the building may adversely effect signal strength, in these cases the wireless node should be checked to ensure correct operation. It is important that the Installer of the 3GS wireless node takes every precaution to ensure that signal strength is optimised by adhering to the installation recommendations in this user guide.

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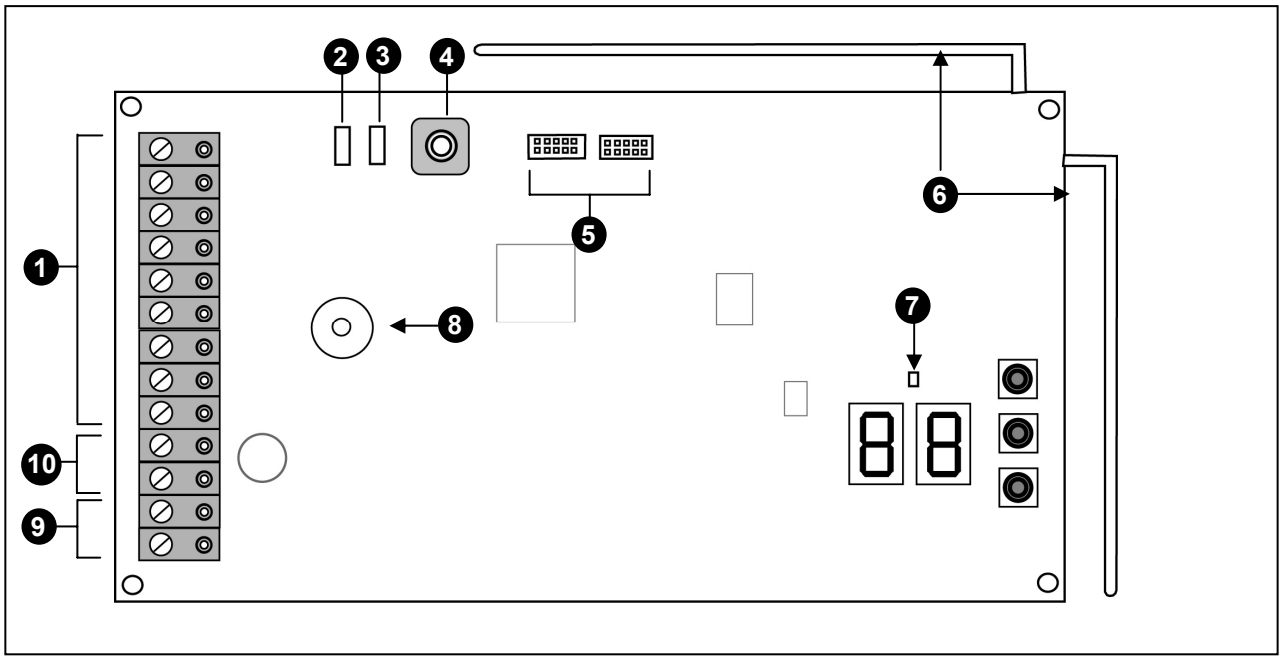
1. Introduction to the 3GS Wireless Node

The 3GS Wireless Node provides an interface for multiple 868 MHz wireless detectors. The node should be powered up for at least 30 seconds before performing any operations. This node does not support IR communication.

Fig 1. 3GS Wireless Node



1. **Ringnet Interface**
   This is the 3GS communications bus used to network Nodes together on the 3GS system. (See 4 – Wiring the RINGNET interface)
2. **Auxiliary Jumper [JP5]**
   This jumper must be fitted, linking the two pins together for correct operation of the wireless Node on the 3GS. (See Note below)
3. **Tamper By-pass [JP2]**
   This jumper setting determines the operation of the tamper. The tamper operation can be **overridden by** fitting JP2. **The engineer must ensure that JP2 is removed before leaving site for the system to comply with standards**.
4. **Front Tamper Switch**
   The wireless Node uses a front tamper switch with spring. When the lid is closed the spring closes the switch.
5. **Production Test**
   This interface is used for production test purposes only. Do NOT use.
6. **Diversity Antenna**
   The diversity antenna extend the range of signal detection. Prevent contact with wires. Do not Bend.
7. **Ringnet status LED**
   This LED Indicates the status of the Ringnet communications bus.
8. **Buzzer**
   The Buzzer is used to provide audio confirmation of programming and assist in to locating the node.
9. **Aux Out**
   An Auxiliary Output of 12V DC is provided to power additional external devices to a maximum of 200 mA.
10. **DC IN**
    The Power input for the Node is 12V DC

Note

Please ensure that jumper **JP5** is fitted for correct operation of the wireless Node. Failure to do so will result in unstable operation of the 3GS system.

2. Features

The following features have been incorporated into the design of the 3GS wireless Node.

- Inputs – multiple wireless device inputs using 868 MHz wireless detectors
- Easy device enrolment (Tamper and activation) using the built in 7-segment display and 3 button keypad.
- Supports tamper or activation enrolment allowing you to choose the most convenient method for a given detector.
- Supports 2 Supervisory modes (Selectable at power-up)
- Display shows status and properties of enrolled devices for instant feedback.
- Front Tamper – Spring with configurable tamper bypass option.
- Sensor Signal strength indication – LED indication (0-9) of the signal strength of an enrolled device.
- Background Signal strength indication – LED indication (0-9) of the background noise signal strength.
- Supervisory Signal detection – LED indication (A) of a missed supervisory signal from enrolled sensor.

3. Technical Specification

Table 1 below details the technical specifications for the 3GS Wireless Node.

Table. 1

Technical Item	Specification
Security Grade	EN50131-1; 1997 Grade 2 PD6662:2004 Grade 2
Environmental Class	Class II Indoor General
PCB Dimensions	150 x 82 x 20 mm
Enclosure Dimensions	200 x 153 x 47 mm
Operating Voltage	13.7 VDC
Minimum Operating Voltage	9.5 VDC
Maximum Operating Current	60 mA
Quiescent Current	50 mA
Inputs	Multiple wireless 868 MHz Detectors
Status LED	Indicates Ringnet communications status
Tamper	Front Spring Tamper
Temperature Range	-10 C to +40 C
Humidity Range	0% to 90% (non-condensing)
Communications	Ringnet - RS485 at 307K2 baud
Memory Backup	Flash
2 Supervisory Modes	General Supervisory Mode (Default) 12 Hr Enhanced Supervisory Mode 2Hr

4. Wiring the Ringnet Interface

The Ringnet interface provides for the networking of nodes to the 3GS system. It uses RS458 in a ring topology providing a maximum distance between nodes of 1000 meters using Belden 9829 cable. Table 2 shows the maximum distances for other cable types.

Table. 2

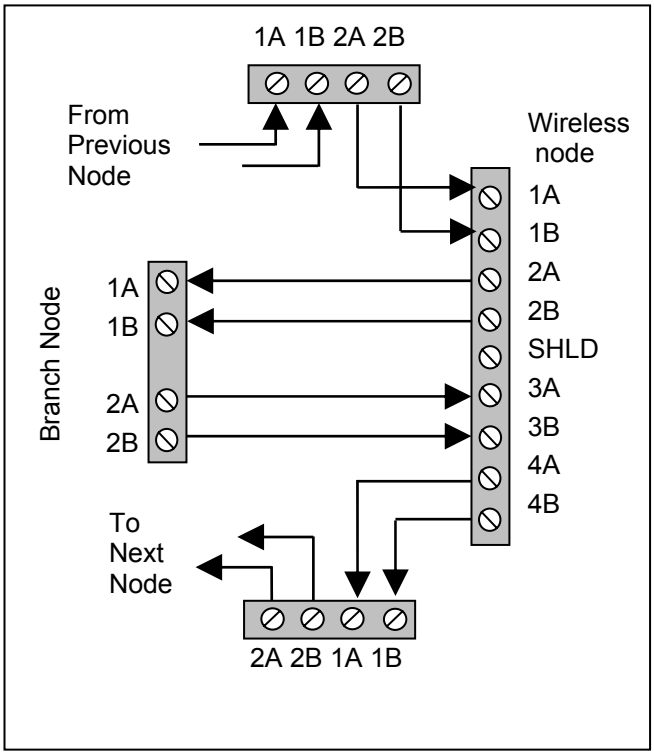
Cable type	Distance between nodes
Belden 9502 (screened)	200m
UTP Category: 5 (solid core)	400m
Belden 9829	400m

The Ringnet interface baud rate is 307kb.

The wiring of the Ringnet interface on the wireless node is shown in Fig.2. The 8 terminals 1A 1B to 4A 4B provide for the connection of an additional branch node if required.

If the branch node is not connected then the 4 terminals 1A 1B 2A 2B are used to connect to the Ringnet cable.

Fig. 2

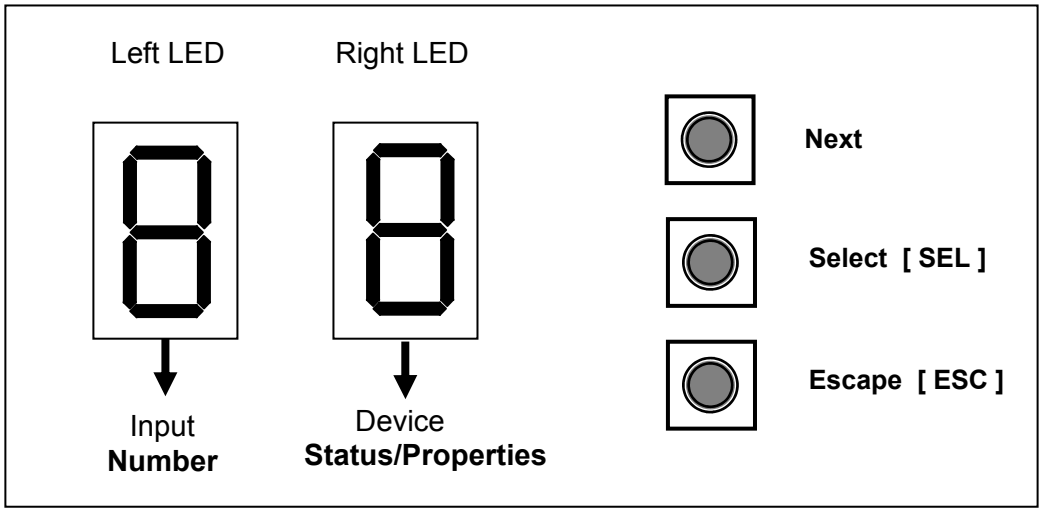


5. Wireless Node Programming Interface Overview

The Wireless Node Programming Interface consists of the following:

1. Two 7 segment LED displays (Left & Right) that indicate the input number and the state / properties of each of the eight possible devices.
2. 3 keys for selecting and programming each device. [Next, Select & Escape]

Fig 3. Wireless Node programming interface



6.1 Key Functions

The function of each of the 3 keys is listed below:

Select [SEL] Key: This key is used to select the required display function. The user can circulate through each of the available display functions by repeatedly pressing this key.

Next Key: This key is used to circulate through each of the eight possible devices for the selected display function. Note: not all of the display functions will have device dependant properties, in these cases the Next key will have no function.

Escape [ESC]: This key is used to exit the current function and return to the normal operating state.

6.2 LED Displays

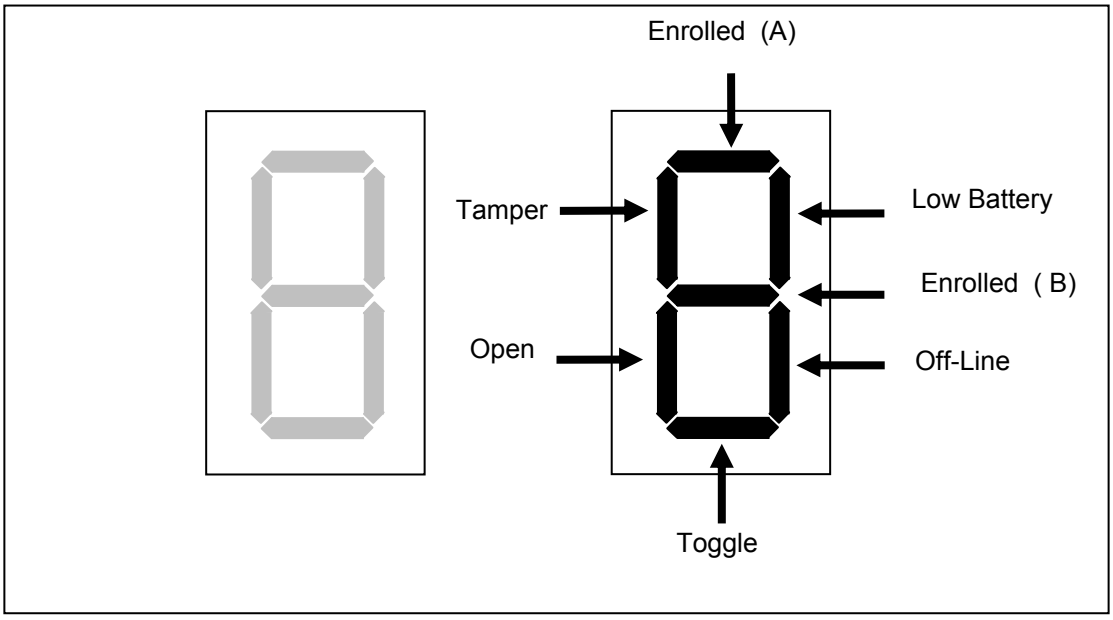
In the normal operating state, the two LED's of the programming interface will be blank. The **Left LED** of the programming interface is used to display the wireless input number associated with a particular display function (8 inputs in total). This LED is also used to indicate that the background signal strength is being monitored as listed below:

Left 7 segment LED Output Description

Display	Description
1	Wireless Input 1
2	Wireless Input 2
3	Wireless Input 3
4	Wireless Input 4
5	Wireless Input 5
6	Wireless Input 6
7	Wireless Input 7
8	Wireless Input 8
F	Background Interference Signal Strength

The **Right LED** of the wireless node programming interface is used to display the Device status. Each of the seven segments corresponds to a particular state or condition as shown below. The Horizontal segments indicate Device Properties while the vertical segments indicate Device states.

Fig.4 Right 7 segment LED Output Display



6. Supervisory Modes

The 3GS wireless node supports 2 types of supervisory modes – General and Enhanced.
The supervisory mode of the node is flashed three times on the two LED's at power up as follows:
- 0 for General Supervisory mode
- 1 for Enhanced Supervisory mode

7.1 General Supervisory Mode

In this mode of supervision the 3GS wireless node will monitor all enrolled wireless sensors for a supervisory signal over a 12 hour period. If no supervisory signal is received from any of the enrolled sensors within that period, the node will indicate that the sensor is lost by displaying "L" on the left 7-segment display with the corresponding sensor input displayed on the right LED. The wireless node will then report the input as a "Short" to the 3GS controller. This supervisory mode is the default mode.

7.2 Enhanced Supervisory Mode

In this mode of supervision the 3GS wireless node will monitor all enrolled wireless sensors for a supervisory signal over a 20 minute period. If no supervisory signal is received from any of the enrolled sensors within that period, the node will indicate an advisory signal ("A") on the left 7-segment display with the corresponding sensor input displayed on the right LED. If after 2 hours the device has not communicated with the node, then a lost signal "L" will be displayed on the 7-segment display and the input will be reported as a "Short" to the 3GS controller.

7.3 To Change Supervisory Modes

To change supervisory modes on the 3GS wireless node,

- Remove power from the node
- hold down the **Select** [SEL] Key and power up the node
- Release key when the 7-segment display starts flashing

A number representing the supervisory mode will be flashed three times on the right 7-segment LED. (**0** for General mode, **1** for Enhanced mode). To revert back to the previous supervisory mode simply repeat the procedure.

Note Supervision applies **only** to supervised sensors. Not all sensors are supervised. Please consult the installation leaflet accompanying the wireless sensor to determine if the sensor is supervised or not.

7. Enrolling Wireless Devices

The 3GS wireless node provides 2 methods of enrolling a wireless sensor.

- Tamper Enrolment
- Activation Enrolment

When enrolling a wireless device on the 3GS wireless node it is important to remember the following points:

1) Wireless sensors successfully enrolled when in close proximity to the node must be checked for signal strength when placed in their final location. (See 8.9 To Display the Sensor Signal Strength)

2) If signal strength is less than 2 you will not be able to enrol the detector. Please consider re-positioning the wireless node or detector or adding an additional wireless node. Europlex recommends that the value of the signal strength of the enrolled device be 4 or above to ensure reliable operation.

3) Europlex recommend that the sensor be located at a minimum distance of 3 meters from the 3GS wireless node during enrolment.

4) Perform a background interference test at the beginning and end of the installation to ensure a value of 0 (See 8.10 To Display the Background interference level.)

8.1 To Enrol a Wireless Device (Tamper Enrolment)

To enrol a device using tamper enrolment the user must simply do the following from the normal operating state:

1. Press the Select [SEL] key and then release to enter monitor mode.
2. Press NEXT to select the required input number (Displayed on Left LED)
3. Hold Select [SEL] until the TAMPER segment flashes and the node starts to beep (indicating the wireless node is in tamper enrolment mode)
4. Trip the tamper on the required detector (Wait for the LED on the sensor to go out), repeat until the wireless node indicates successful enrolment by giving a long beep and returning to monitor mode.
5. Note that the ENROLLED (A) segment for this input is now on.
6. Verify correct enrolment by tripping the detector and checking that the OPEN segment comes on.
7. Press escape to commit enrolment to FLASH memory.

8.2 To Enrol a Twinned Wireless Device (Tamper Enrolment)

A second (or twinned) wireless device can be enrolled on the **same** input allowing the wireless node to accommodate up to 16 wireless sensors. To enrol a twinned device using tamper enrolment the user must simply do the following from the normal operating state:

1. Press the Select [SEL] key and then release to enter monitor mode.
2. Press NEXT to select the required input number (Displayed on Left LED)
3. Hold Select [SEL] until the TAMPER segment flashes and the node starts to beep (indicating the wireless node is in tamper enrolment mode)
4. Trip the tamper on the required detector (Wait for the LED on the sensor to go out), repeat until the wireless node indicates successful enrolment by giving a long beep and returning to monitor mode.
5. Note that the ENROLLED (B) segment for this input is now on.
6. Verify correct enrolment by tripping the detector and checking that the OPEN segment comes on.
7. Press escape to commit enrolment to FLASH memory.

Note If an attempt is made to enrol a **third** device on a single input, the 7 segment LEDs will display the characters " E r " and the node will beep quickly to indicate an error.

8.3 To Enrol a Wireless Device (Activation Enrolment)

Some detectors do not have tamper detection capability, to enrol these detectors you must use Activation enrolment. To enrol a device using activation enrolment the user must simply do the following :

1. Press the Select [SEL] key and then release to enter monitor mode.
2. Press NEXT to select the required input number (Displayed on Left LED)
3. Hold the Select [SEL] Key until the flashing segment changes to the OPEN segment (indicating that the wireless node is in activation enrolment mode)
4. Trip the required detector (wait for the LED on the sensor to go out), repeat until the wireless node indicates successful enrolment by giving a long beep and returning to monitor mode.
5. Note that the ENROLLED (A) segment for this input is now on.
6. Verify correct enrolment by tripping the detector and checking that the OPEN segment comes on.
7. Press escape to commit enrolment to FLASH memory.

8.4 To Enrol a Twinned Wireless Device (Activation Enrolment)

To enrol a second or twinned device using activation enrolment the user must simply do the following :

1. Press the Select [SEL] key and then release to enter monitor mode.
2. Press NEXT to select the required input number (Displayed on Left LED)
3. Hold the Select [SEL] Key until the flashing segment changes to the OPEN segment (indicating that the wireless node is in activation enrolment mode)
4. Trip the required detector (wait for the LED on the sensor to go out), repeat until the wireless node indicates successful enrolment by giving a long beep and returning to monitor mode.
5. Note that the ENROLLED (B) segment for this input is now on.
6. Verify correct enrolment by tripping the detector and checking that the OPEN segment comes on.
7. Press escape to commit enrolment to FLASH memory.

8.5 To Move a Device to a different input

Any enrolled wireless sensor can be switched to a different input. To move the sensor simply repeat the enrolment process (Activation or Tamper) for that sensor using a different input number. The 3GS wireless node will automatically remove the sensor from the previous input.

Note

When moving a twinned device to a different input, both devices will be removed from the original input. Therefore each device must be separately enrolled to their respective inputs.

8.6 To Display the Device Status

To display the status of a device from the normal operating state the user must do the following:

1. Press the Select [SEL] key to enter monitor mode.
2. Press NEXT to select the required input number (Displayed on Left LED)
3. The status of the selected input device will be displayed on the right LED in accordance with the display properties shown in fig. 3.

8.7 To Set up a Toggle Device

A toggle device changes state for each activation of the wireless detector. Only **non-supervised** sensors should be enrolled as toggle devices. To set up a toggle device the user must do the following:

1. Enter the required enrolment Mode as described above [Tamper or Activation]
2. Press the NEXT key, the toggle segment of the display will come on.
3. Enrol Device as before.

8.8 To Remove a Device

1. In monitor mode select the input that you wish to remove.
2. Enter enrolment mode (Hold the SEL key until TAMPER segment flashes)
3. Press the ESC key

Note

When removing a twinned device, both devices will be removed at the same time. If one of the twinned devices is required to remain on that input, then it must be enrolled again.

8.9 To Display the Sensor Signal Strength

The 3GS Wireless node provides information on the signal strength of the wireless signal from the sensor to the wireless node. To display this information from the normal operating state the user must do the following:

1. Press the Select [SEL] Key twice.
2. The Left LED will display the Input number and the signal strength for that input will be flashed on the right LED as a value from 0 (Min) to 9 (Max) .
3. To view the signal strength of the next input simply press the Next [NXT] Key.
4. To return to the normal operating condition press the Escape [ESC] Key.

8.10 To Display the Background interference level.

The 3GS wireless node also provides a measure of the background electromagnetic interference in the frequency band (868/869 MHz). To display this information from the normal operating state the user must do the following:

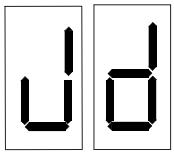
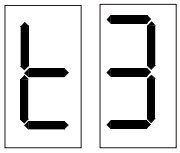
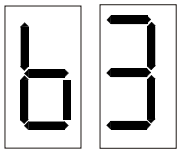
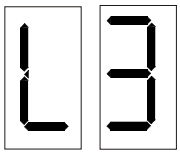
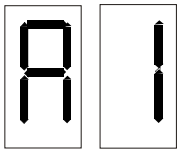
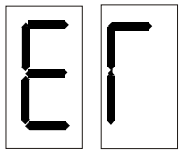
1. Press the Select [SEL] Key three times.
2. The Left LED will display the letter "**F**"
3. The right LED will display a value from 1 (Min) to 8 (Max) to indicate the background interference level.
4. To return to the normal operating condition press the Escape [ESC] Key.

Note

The value displayed on the right LED is a measure of the average electromagnetic interference that was recorded in the frequency band (868/869 MHz) over a given time period. If a non zero value is displayed, it is recommended that the Wireless node be positioned in a different location which yields a background interference level of 0. If a level of 0 cannot be obtained please contact Europlex for advice.

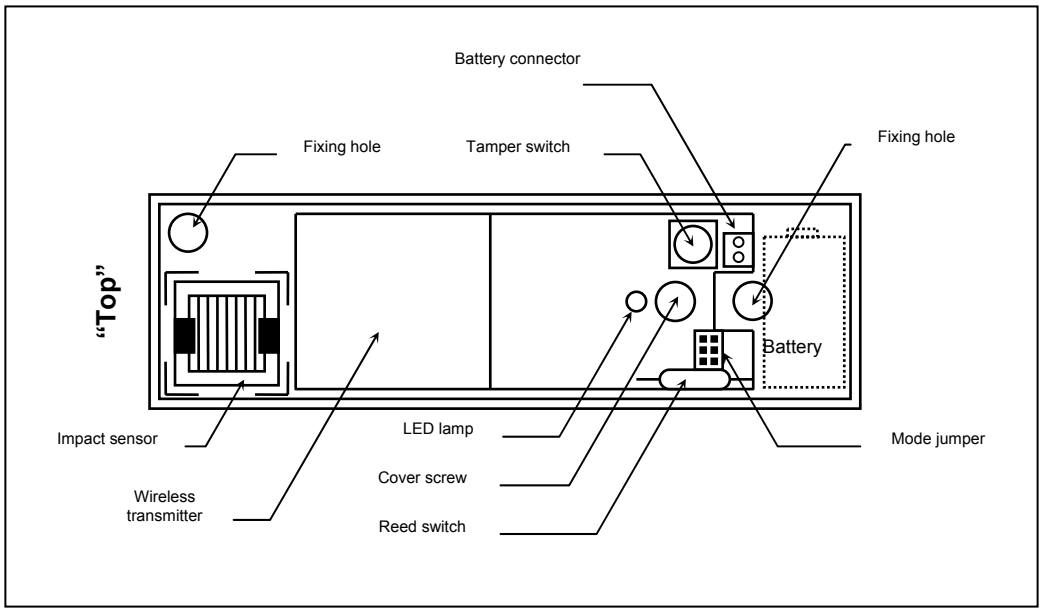
8. Wireless Node 7-segment LED displays during normal operation.

During normal operation of the wireless node, the 7 segment display LED's will provide visual indicators if certain events occur. These indicators will aid the installer in the maintenance, debug and operation of the wireless node.

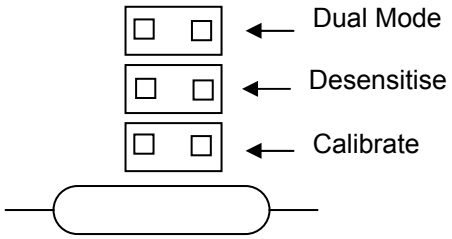
	**Indication of Jamming Frequency Detection.** If a Jamming signal is detected in the sensor frequency range (868MHz or 869MHz), the 7 segment LEDs will present the characters "Jd" as shown. This is reported to the 3GS controller as a node Jamming detect event.
	**Indication of tamper detection** If a tamper is detected on any of the input devices, the left LED will indicate the tamper condition with the character " t " and the right LED will indicate the wireless input number of the tamper. This display will flash and the node will beep every minute until the tamper is reset. If a tamper of the wireless node itself is detected the display will indicate "t 0". (e.g. the LEDs shown indicate a tamper condition detected on device 3) This is reported to the 3GS controller as a zone tamper (discon) event.
	**Indication of Low Battery Detection** If a low battery condition is detected in any of the devices, the left LED will indicate the low battery condition with the character " b " and the right LED will indicate the wireless device number where the low battery condition was detected. (e.g. the LED's shown indicate a low battery condition detected on device 3) This is reported to the 3GS controller as a node battery problem.
	**Indication of Lost or off-line device** If a lost or off-line condition is detected in any of the devices, the left LED will indicate this condition with the character " L " and the right LED will indicate the wireless device number where the lost condition was detected. (e.g. the LED's shown opposite indicate a lost sensor condition detected on device 3) This is reported to the 3GS controller as a zone short event.
	**Supervisory fault condition on Input** When a supervisory signal from an enrolled wireless sensor has not been detected within the required period. This condition will only be displayed for the Enhanced Supervisory mode. (e.g. the LED display shown indicates a supervisory fault condition on input 1.) This is reported to the 3GS controller as a supervision advisory event.
	**Error when attempting to enrol a third device on an input** If an attempt is made to enrol a **third** device on a single input, the 7 segment LEDs will display the characters " Er " and the node will beep quickly to indicate an error. This is not reported to the 3GS controller.

Appendix-1 Enrolling the MCT-303 Shock Sensor

The 3GS wireless node supports a complete range of sensors such as PIR's, contact sensors, shock sensors, etc…For a complete list please contact Europlex.



The MCT-303 is a single or dual zone wireless sensor designed to provide perimeter protection without the need for expensive and time-consuming cabling. The unit has two modes, a shock sensor digitally detects impacts made to the mounting surface whilst a reed switch can be used to monitor opening sections of doors and windows.



For the correct operation of the MCT-303 shock sensor with the 3GS wireless node, please ensure that the sensor is configured for Dual mode operation (Top Link ON)

Before enrolling the MCT-303 Shock Sensor onto the 3GS Wireless Node please ensure that the sensor is calibrated as detailed below:

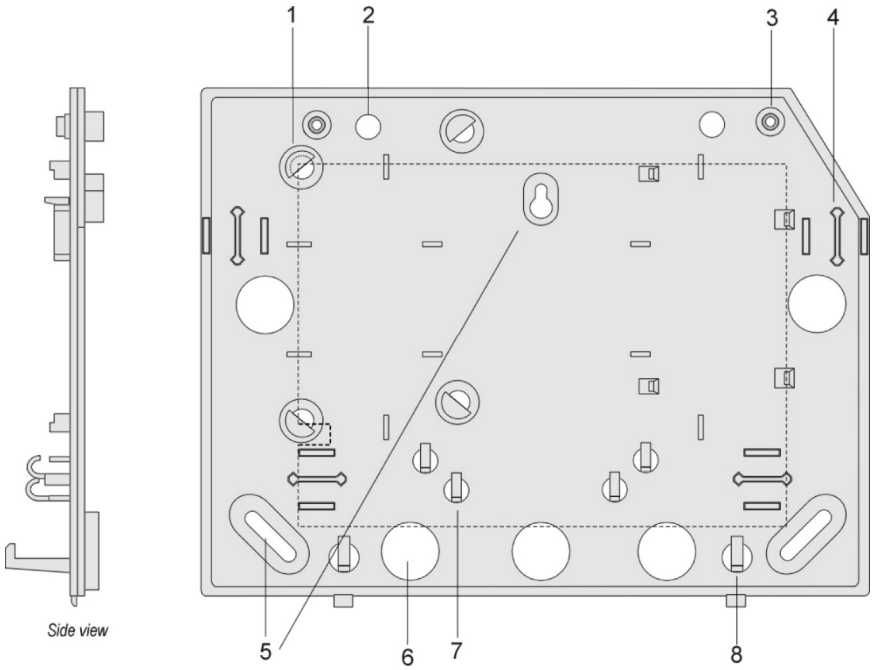
Calibrating the MCT-303 Shock Sensor

- Place the jumper link onto the calibrate pins (shown in the diagram above).
- Press the tamper switch once and release.
- Expose the MCT-303 sensor to a sample of background vibration. This vibration may consist of tapping the window with the butt of a screwdriver or operating loud machinery near the sensor.
- Press the tamper switch again to complete the calibration process.
- Remove the Jumper link from the Calibrate pins.

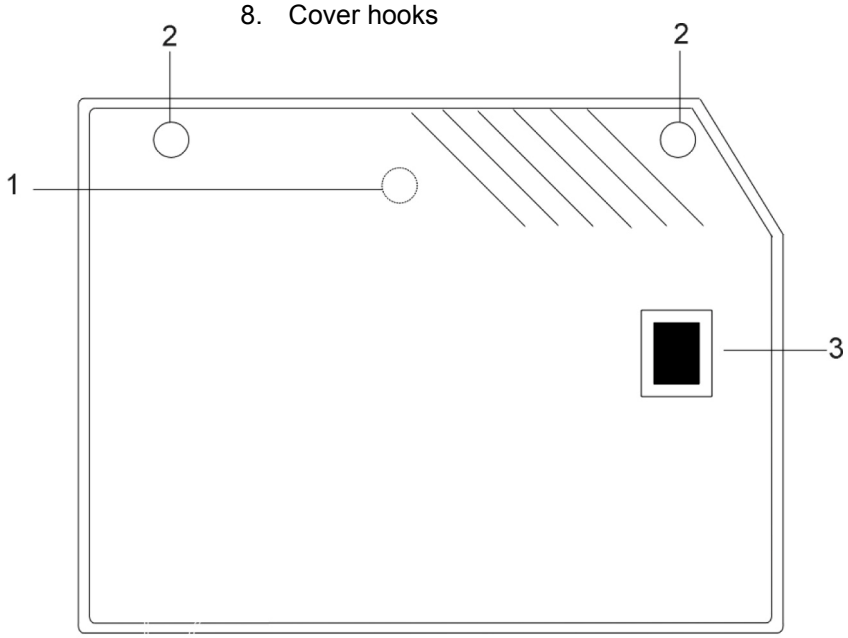
Additional information on calibrating the MCT-303 sensor is available from the sensor installation leaflet.

Appendix-2 Wireless Node Enclosure

The wireless node enclosure specifications are included below. The enclosure material is composed of an ABS resin with a flammability rating to UL94HB.



1. Node anchor points
2. Wall spacers
3. Cover anchor points
4. Cable grips
5. Mounting holes
6. Cable entry holes
7. Cable ties
8. Cover hooks

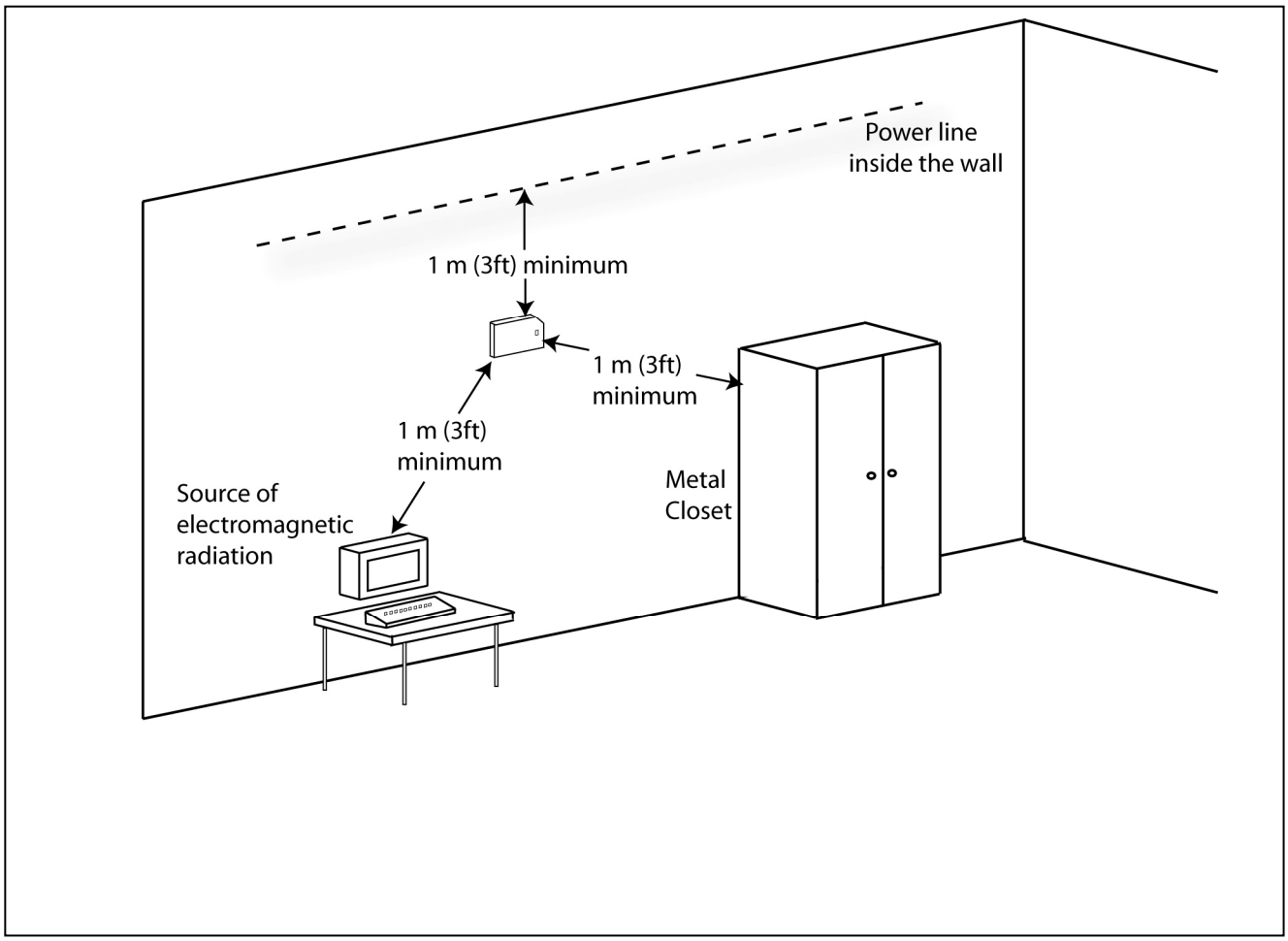


1. Front tamper guide
2. Cover fixing screws
3. Infrared window

Appendix-3 Installing the 3GS Wireless Node

When installing the 3GS wireless node it is important to minimise any electromagnetic interference from the environment in which the node is installed. Always adhere to the following guidelines for good installation practice:

- Ensure that the node is at a minimum of 1 meter away from mains power lines.
- Ensure that the node is at a minimum of 1 meter away from metal cabinets or any other large metallic objects.
- Ensure that the node is at a minimum of 1 meter away from any sources of electromagnetic radiation.



Note

Europlex recommend that the wireless sensor be located at a minimum distance of 3 meters from the 3GS wireless node.